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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/728,680
Filing Date: December 05, 2003
Appellant(s): FERNANDEZ-CORBATON ET AL.

Fernandez-Corbaton
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 4/1/2008 appealing from the Office action mailed 11/2/2007

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

Claims 9-10, 16-17, 26-27 and 33-34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2002/0154616	Ayoma et al.	10-2002
2003/0123406	Yavuz et al.	07-2003
WO/02/13448	Farlow et al.	02-2002
6904081	Frank, Collin David	06-2005

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4, 11,18,21,28,35, and 36 rejected under 35 U.S.C. 102(b) as being anticipated by Aoyama (US 2002/0154616).

Regarding **claim 1**, Aoyama teaches a base station that adaptively allocates at least one resource between a traffic signal and a dedicated reference signal, comprising:

means for receiving a quality metric from a remote station, wherein the quality metric indicates the quality of a signal transmitted from the base station and received by the remote station ("**CIR", carrier to interference ratio**, Paragraph [0077], Figure 8-10);

means for using the quality metric to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal to maximize the capacity for transmitting the traffic signal to the remote station ("**the total transmission power is fixed", "the transmission power ratio between code-multiplexed transmit data and a dedicated pilot signal is controlled in accordance with the propagation environment",** Paragraph [0139]); and

means for transmitting the dedicated reference signal and the traffic signal to the remote station (Paragraph [0006]), wherein the received common reference signal and the received dedicated reference signal are used to train a receiver at the remote station (Paragraph [0053]; Figure 6; refer Paragraphs [0061-0081] for further teachings regarding remote station).

Regarding **claim 4,** Aoyama further teaches the base station, further comprising means for transmitting a common reference signal to the remote station and to a plurality of other remote stations (Paragraph [0006], Figure 3).

Claims 11,18,28,35 and 36 are also rejected for the same reason as set forth in the above rejection of claim 1.

Claim 21 is rejected for the same reason as set forth in claim 4.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5-6,12-13,22-23 and 29-30 are rejected under 35 U.S.C. 103(a) as being obvious over in view of Aoyama (US 2002/0154616) in view of Yavuz et al. (hereinafter Yavuz) (US 2003/0123406).

Regarding **claim 5,12,22, and 29**, Aoyama teaches all the particulars of the claim except wherein the quality metric comprises a signal-to- interference-and-noise ratio of the common reference signal received at the remote station. However, Yavuz teaches in an analogous art, wherein the quality metric comprises a signal-to- interference-and-noise ratio of the common reference signal received at the remote station (Paragraph [0008], lines 5-10; Paragraph [0025], lines 13-16). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to use the quality metric comprises a

signal-to- interference-and-noise ratio of the common reference signal received at the remote station in order to include the effect of noise that is significant compared to the interference.

Regarding **claims 6,13,23 and 30**, Aoyama teaches all the particulars of the claim except wherein the quality metric comprises a symbol error rate of the common reference signal received at the remote station. However, Yavuz teaches in an analogous art, wherein the quality metric comprises a symbol error rate of the common reference signal received at the remote station (Paragraph [0027], line 9). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to use symbol error rate of the common reference signal received at the remote station as an alternate quality metric in order to avoid packet retransmission.

Claims 7-8,14-15,24-25 and 31-32 are rejected under 35 U.S.C. 103(a) as being obvious over Aoyama (US 2002/0154616) in view of Farlow (WO 02/13448 A2).

Regarding **claims 7,14,24 and 31**, Aoyama discloses all the particulars of the claim except for means for transmitting a parameter e_x to the remote station, wherein the parameter represents the portion of the resource allocated to the dedicated reference signal.

However, Farlow teaches in an analogous art, means for transmitting a parameter to the remote station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal **(Page 10, lines 20-25).** Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to have means for

transmitting a parameter to the remote station, wherein the parameter e_x represents the portion of the resource allocated to the dedi cated reference signal. This modification provides a method and system of power control adaption for data rate changes resulting in more optimal performance.

Also, this modification is a necessity than an inventive step. This is because, the length of the reference signal changes that information has to be informed to the receiver to process the signal. Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to have means for transmitting a parameter to the remote station, wherein the parameter represents the portion of the resource allocated to the dedicated reference signal.

Regarding **claims 8,15,25, and 32,** Aoyama discloses all the particulars of the claim except for transmitting a parameter q to the base station, wherein the parameter Θ=(L-1)/n.

However, Farlow discloses in an analogous art transmitting a parameter to the base station, wherein the parameter Θ=(L-1)/n (Page 9, lines 20-24). Therefore, it would be obvious to one of ordinary skill in the art at the time invention to transmit a parameter q to the base station, wherein the parameter Θ=(L-1)/n. This modification is useful in estimating channel conditions and thus reducing the signal distortion introduced by the channel.

(10) Response to Argument

A. Claims 1,4,11,18,21,28 and 35-36

Claims 1, 4, 18, 21 and 35

Appellant argued that Aoyama does not disclose “using the quality metric" that is “received … from a remote station” to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal,” as recited in claim 1. It appears that Ayoma teaches (Paragraph [0064])," **the DRC signal is .. transmitted to the base station apparatus".** Aoyama further teaches “**the DRC signal indicating relevance transmission rate**” … **"based on the CIR, the transmission rate** at which communication is possible is then generated by the DRC signal creation section", Paragraph [0063]. Furthermore, Aoyama teaches,” **"the communication resource allocation to each communication terminal apparatus is determined ... based on the DRC signal**", (Paragraph [0066]). Note the resource allocation is based on the transmission rate information contained in the DRC signal. The transmission rate is based on CIR and therefore, DRC signal contains the quality metric information. In addition, Aoyama teaches (Paragraph [0008],"**base station apparatus** … sets a transmission arte for each communication terminal apparatus and sends a signal **indicating communication resource allocation to each of communication terminal apparatuses”,** and further teaches, “the communication resource allocation … is based on the DRC signal” (Paragraph [[0066]) (**reads on adaptively allocating**) and the total transmission power is fixed (**reads on fixed amount of power**). The transmission power ratio between code–multiplexed transmit data and a dedicated pilot signal is controlled in accordance with the propagation environment” (Paragraph [0139]). Note: **the transmission rate and power are directly related, higher transmission rate requires higher power.** Therefore, it is apparent that Aoyama teaches the limitation

“using the quality metric" that is “received … from a remote station” to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal,” as recited in claim 1.

Appellant further argued that, ”claim 1 does not merely recite a “quality metric”; rather, claim 1, recites, ”means for receiving a quality metric from a remote station" and “means for using the quality metric to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal”. It is noted that Aoyama teaches that the DRC signal is transmitted to the base station as a radio signal from the antenna via a transmit/receive duplexer … received by the antenna of the base station apparatus ... and the DRC signal is extracted (**reads on means for receiving a quality metric from a remote station**) (Paragraph [0065 -0066]). Aoyama further teaches "communication resource allocation to each communication terminal apparatus is determined by the transmission determination section 106 based on the DRC signal". This reads on means for using the quality metric to adaptively allocate resources. In addition, Aoyama teaches, “the communication resource allocation … is based on the DRC signal” (Paragraph [[0066]) (**reads on adaptively allocating**) and further teaches the total transmission power is fixed (**reads on fixed amount of power**), the transmission power ratio between code–multiplexed transmit data and a dedicated pilot signal is controlled in accordance with the propagation environment” (Paragraph [0139]). Note: the transmission rate and power are directly related, i.e., higher transmission rate requires higher power. Thus, this reads on allocating a fixed amount of power between the traffic signal and the dedicated reference signal. Aoyama's

system is also adapting to phase changes due to Doppler spread in addition to the channel quality. Appellant's invention is a particular case of Aoyama where only the channel quality is considered and not the phase changes due to doppler spread (or the motion of the mobile terminal). Therefore, the claimed invention as recited in claim 1 can be read by Aoyama such that Aoyama teaches a means for receiving a quality metric from a remote station" and "means for using the quality metric to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal. In view of above it is apparent that Ayoma teaches a base station that adaptively allocates at least one resource between a traffic signal and a dedicated reference signal, comprising: means for receiving a quality metric from a remote station, wherein the quality metric indicates the quality of a signal transmitted from the base station and received by the remote station ("**The DRC signal is … transmitted to the base station apparatus**", Paragraph [0064]; "**the DRC signal indicating relevance transmission rate**", "**based on the CIR the transmission rate** at which communication is possible", Paragraph [0063]; "**the communication resource allocation to each communication terminal apparatus is determined ... based on the DRC signal**", Paragraph [0066]); ***Note: The resource allocation is based DRC signal which contains information regarding transmission rate (quality is calculated by the transmission rate) that is based on CIR. Therefore, the DRC signal contains the quality metric,*** means for using the quality metric to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal to maximize the capacity for transmitting the traffic signal to the remote station ("**the total transmission power is**

fixed", "the transmission power ratio between code-multiplexed transmit data and a dedicated pilot signal is controlled in accordance with the propagation environment", Paragraph [0139, 01454]); and means for transmitting the dedicated reference signal and the traffic signal to the remote station ("**a signal indicating communication resource allocation ... transmitted as a radio signal to all communication terminal apparatuses**", Paragraph [0067]); wherein the received common reference signal and the received dedicated reference signal are used to train a receiver at the remote station (Paragraph [0053]; Figure 6; refer Paragraphs [0061-0081] for further teachings regarding remote station).

Claims 11,28 and 36

Appellant argues that in Aoyama it is the base station apparatus 800 that "determines the state of propagation environment". This is in contrast to claim 11 which recites the remote station .. determines a quality metric of the received common reference signal and transmit the quality metric to the base station.

The base station of Aoyama determines the phase changes due to the motion of the mobile stations in addition to receiving the quality metric from the remote station ("quality to be maintained even when the phase changes are sudden", Paragraph [0013]). If the phase changes due to motion of the mobile terminal are not significant then the resource allocation by the base station is based only on the quality metric obtained from the DRC signal that is transmitted from the mobile terminal.

Aoyama teaches that the DRC signal is transmitted to the base station as a radio signal from the antenna via a transmit/receive duplexer … received by the antenna of

the base station apparatus ... and the DRC signal is extracted (**reads on receiving a quality metric from a remote station**) (Paragraph [0065 -0066]).

Therefore, it is apparent that Aoyama teaches the limitation as recited in claims 11, 28 and 36.

B. Claims 5-6, 12-13, 22-23 and 29-30

Claims 5-6 and 22-23

Claims 5-6 depend from claim 1. Claims 22-23 depend from claim 18, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim 1. Accordingly Examiner's rejection of claims 5-6 and 22-23 have been maintained for the same reasons as those presented above.

Claims 12-13 and 29-30

Claims 12-13 depend from claim 11. Claims 29-30 depend from claim 28, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim 11. Accordingly Examiner's rejection of claims 12-13 and 29-30 have been maintained for the same reasons as those presented above.

C. Claims 7-8, 14-15, 24-25 and 31-32

Claims 7 and 24

Claims recite, "means (transmitter) for transmitting a parameter e_x to the remote station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal".

Aoyama teaches ([Paragraph [0068]),"each communication apparatus the signal indicating communication resource allocation transmitted from the base station apparatus is received".

Aoyama further teaches (Paragraph [0073]),"The signal transmitted as a radio signal from the base station apparatus is received by the antenna of the communication terminal apparatus".

This reads on means for transmitting a signal from the base station.

Aoyama teaches (Paragraph [0139])," total transmission power is fixed. ... transmission ratio between code multiplexed transmit data and a dedicated pilot signal is controlled accordance with the propagation environment".

The transmission ratio between the code multiplexed data and a dedicated pilot signal also reads on the parameter e_x, wherein the parameter e_x represents portion of the resource allocated to the dedicated reference signal.

Appellant argues that the parameters that refereed to by Farlow do not represent the portion of the resource allocated to the dedicated reference signal as recited in claims 7 and 24.

Farlow also teaches the "**training sequence length parameter** to control the insertion of training sequences" (Page 10, lines 24-25). This reads on the portion of the resource allocated to the dedicated reference signal.

Packet length (fixed, is known in advance) = number of data symbols + number of training (pilot) symbols.

A (known) = B+ C

If C or C/A is known B can be calculated, since A is known.

Transmitting C (Farlow: Training sequence length, line 24, Page 10) or C/A (as done in the current application) or any other algebraic combinations is essentially the same thing.

Note: The length of the training sequences or the number of tap coefficients or the transmission rate or the transmission power allocated to the dedicated reference signal is changing based on the channel quality. If the environment is good it requires short sequences or tap coefficients or lower rate or less power to estimate the channel.

Any adaptive filter requires information such as length of the training sequences (also related to power) or the number of tap coefficients (related to power) or the transmission rate (related to power)or the transmission power allocated to the dedicated reference signal to be transmitted to the receiving station in order to separate the reference signals from the user data.

Appellant argues that one possible alternative to what is claimed the base station may agree on some implicit rules for determining the parameter. No implicit rule (deterministic rule) can be used for a random (or time varying) environment. Further if there is any implicit rule available that could be a novel since there is no need for transmitting a control parameter from the base station.

Contrary to appellant's arguments on page 20, Farlow teaches generating commands for the remote units to establish values of the parameters (page 10, lines 20-21; the parameters include training sequence length therefore, reads on the portion of resource allocated to the remote unit) and transmitting the commands to the remote unit

(Page 3, lines 29-30). Therefore, Farlow teaches the limitation for transmitting a parameter to the remote station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal.

Claims 8 and 25

Claim 8 depends from claim 1. Claim 25 depends from claim 18, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim 1. Accordingly Examiner's rejection of claims 8 and 25 have been maintained for the same reasons as those presented above.

Claims 14 and 31

Claims recite, "means (receiver) for receiving a parameter e_x from the base station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal".

Aoyama teaches ([Paragraph [0068]),"each communication apparatus the signal indicating communication resource allocation transmitted from the base station apparatus is received".

Aoyama further teaches (Paragraph [0073]),"The signal transmitted as a radio signal from the base station apparatus is received by the antenna of the communication terminal apparatus".

This reads on means for receiving the signal from the base station.

Aoyama further teaches, "Total transmission power is fixed. ... transmission ratio between code multiplexed transmit data and a dedicated pilot signal is controlled accordance with the propagation environment".

The transmission ratio between the code multiplexed data and a dedicated pilot signal also reads on the parameter e_x, wherein the parameter e_x represents portion of the resource allocated to the dedicated reference signal.

Appellant argues that the parameters that refereed to by Farlow do not represent the portion of the resource allocated to the dedicated reference signal as recited in claims 14 and 31.

Farlow further eaches the "**training sequence length parameter** to control the insertion of training sequences" (Page 10, lines 24-25). This reads on the portion of the resource allocated to the dedicated reference signal.

Packet length (fixed, is known in advance) = number of data symbols + number of training (pilot) symbols.

A (known) = B+ C

If C or C/A is known B can be calculated, since A is known.

Transmitting C (Farlow: Training sequence length, line 24, Page 10) or C/A (as done in the current application) or any other algebraic combinations is essentially the same thing.

Note: The length of the training sequences or the number of tap coefficients or the transmission rate or the transmission power allocated to the dedicated reference signal is changing based on the channel quality. If the environment is good it requires short sequences or tap coefficients or lower rate or less power to estimate the channel.

Any adaptive filter requires information such as length of the training sequences (also related to power) or the number of tap coefficients (related to power) or the

transmission rate (related to power) or the transmission power allocated to the dedicated reference signal to be transmitted to the receiving station in order to separate the reference signals from the user data.

Appellant argues that one possible alternative to what is claimed the base station may agree on some implicit rules for determining the parameter. No implicit rule (deterministic rule) can be used for a random (or time varying) environment. Further if there is any implicit rule available that could be a novel since there is no need for transmitting a control parameter from the base station.

Contrary to appellant's arguments on page 21, Farlow teaches generating commands for the remote units to establish values of the parameters (page 10, lines 20-21; the parameters include training sequence length therefore, reads on the portion of resource allocated to the remote unit) and transmitting the commands to the remote unit (Page 3, lines 29-30). Therefore, Farlow teaches the limitation for transmitting a parameter to the remote station, wherein the parameter represents the portion of the resource allocated to the dedicated reference signal.

Claims 15 and 32

Claim 15 depends from claim 11. Claim 32 depends from claim 28, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim 11. Accordingly Examiner's rejection of claims 15 and 32 have been maintained for the same reasons as those presented above.

D. Claims 9-10, 16-17, 26-27 and 33-34

Appellant's arguments have been considered and are persuasive. Therefore, the claims 9-10, 16-17, 26-27 and 33-34 are objected due to lack of teachings by the prior art. The arguments are therefore, moot in view of the objections to the claims 9-10, 16-17, 26-27 and 33-34.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Muthuswamy G. Manoharan/

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